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# How Has the Debt Crisis Affected Commercial Banks?

Harry Huizinga

Top commercial banks seemed to have weathered the debt crisis. It remains to be seen whether their current strength and stability will help re-establish normal credit relationships between private banks and the developing countries.

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To what extent can commercial banks absorb loan losses from the less-developed countries (LDCs)? Some losses by private creditors are likely to be part of any resolution of the debt crisis, and such losses are implicit in some of the many proposals for dealing with the crisis.

Bank stock prices for U.S. commercial banks already reflect a high discount on (and the low quality of) developing country debt — so no major U.S. bank is likely to fold if it gets a return on its LDC debt consistent with the prices of LDC debt on the secondary market. The top banks in Canada, France, Japan, the United Kingdom, and West Germany are less heavily exposed to LDC debt than their U.S. counterparts — and thus correspondingly less imperiled by the debt crisis than the U.S. banks.

The relative safety of most of the top creditor banks renders their insistence on full servicing of the LDC loans less urgent and should in principle open the door to partial debt forgiveness. It also, however, enables the banks to boycott the by now routine schedulings and new money packages and at the same time to withstand the accounting consequences of such a move.

Some form of debt forgiveness may in practice lead to a quicker resumption of private capital flows to the LDCs and increased investment in the developing countries. But such flows may never again reach the avalanche proportions of the 1970s, which resulted from the unique coincidence of sluggish economic growth in the OECD, large OPEC surpluses, and a number of regulatory changes in the creditor countries that directed bank lending overseas.

It may take time, but through a combination of self-interest and public policy the current impasse in the debt crisis should be overcome. This may be done partly through large-scale debt swaps sponsored by private or public agencies. Debt swaps are already being implemented bilaterally in small steps and through a variety of instruments, including debt conversions and buybacks.

This paper, prepared for the conference "Dealing with the Debt Crisis," is a product of the Debt and International Finance Division, International Economics Department. Copies are available free from the World Bank, 1818 H Street, NW, Washington, DC 20433. Please contact Leah Chavarria, room S7-033, extension 33730.

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by
Harry Huizinga

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## 1. Introduction

The last six years have not seen the gradual diminution of the developing country debt crisis that many observers had predicted and hoped for. Instead, third world indebtedness has remained high - in fact the ratio of medium and long term debt to GNP has gone up from 50.1 per cent in 1985 to 53.7 per cents in 1987 for the set of highly indebted countries. At the same time, real economic growth in the developing countries has proven disappointing - at lukewarm rates of 3.0 and 2.5 per cent in 1985 and 1987 for the same group of countries.[1] As the current debt strategy of 'muddling through' appears unlikely to produce a timely and satisfactory outcome of the debt crisis, it is warranted to discuss and explore other avenues. This chapter brings to any such discussion an account of the experience of the main creditor banking systems with LDC debt.

A main question the chapter attempts to answer is to what extent the commercial banks at present could possibly absorb LDC loan losses. Some losses by private creditors are likely to be a part of any resolution of the debt crisis in the years to come, and such losses are implicit in some of the many proposals for dealing with the debt crisis. Extending earlier work by Sachs and Huizinga [1987], the chapter finds that bank stock prices to a large extent already reflect the low quality of LDC loans, and that thus no major U.S. bank is likely to fold if it gets a return on its LDC debt from now on that is consistent with the prices of LDC debt observed in the secondary market. Major banks in other creditor countries, such as Canada, France, Germany, Japan and the United Kingdom, are shown to be less heavily exposured to the developing countries than the top U.S. banks. Thus these banks turn out to be even less imperiled by their LDC portfolio's than the

U.S. banks.

The relative safety of almost all the top creditor banks renders their unfailing insistence on full servicing of the LDC loans less urgent and less appealing, and in principle it could open the road to partial debt forgiveness. However, it also enables the banks to boycott the by now routine reschedulings and new money packages, and at the same to withstand the accounting consequences of such a move. Some form of debt forgiveness may turn out to be conducive to a resumption of private capital flows to the LDC's and increased investment in the developing countries - although such flows may never again reach the avalanche proportions of the 1970s, which resulted from a unique coincidence of sluggish economic growth in the OECD, large OPEC surpluses, and a number of regulatory changes within the creditor countries that directed bank leading overseas.[2]

Commercial bank debt constitutes the largest part of LDC debt and it is in some ways the most difficult to grapple with - both because of the large number of individual borrowers and lenders and because some of the relevant information is private. In 1987 commercial bank claims on LCD's stood at $ 644 billion, which is approximately 57 per cent of a total LDC external debt of $ 1,130 billion. As shown in Table 1, $ 257 million, which is somewhat less than half of all commercial bank lending to LDC's, is concentrated in Latin America, with smaller commercial bank indebtedness of $ 125 billion in Asia and $ 61 billion in Africa.

Of the total bank debt of $ 644 billion, $ 290 billion or roughly 45 percent is owed by a relatively small number of 17 so-called highly indebted countries. A breakdown of the debt owed by these highly indebted countries is given in Table 2. The table shows that of the 17 countries Brazil and

Mexico stand out with commercial bank obligations of $ 81 and $ 74 billion respectively. These 17 highly indebted countries are those problem debtors with rather large absolute amounts of debt bank; they do not include debtor nations such as Liberia and Sudan that, although they have small absolute exposures, are beyond solvency by most people's standards.

On the creditor side, LDC exposure is highly concentrated within a few countries as well. The distribution of LDC loans among the major creditor banking systems is reported in Table 3. The U.S banks are shown to be the largest creditor group to the developing countries with combined claims of $ 129 billion at the end of 1987, which amounts to about 20 per cent of total commercial bank loans to the LDC's, down from 24 per cent in 1985. The United Kingdom and West Germany, on the other hand, have seen their exposures to the LDC's grow somewhat during the last 4 years, to 16 and 8 per cent of total LDC bank debt in 1987 respectively. Absent from the list of creditor nations in Table 3 is Japan, as her combined LDC exposure is not known precisely. Williamson [1988] puts the Japanese proportion of LDC commercial bank debt at 12 per cent for 1986.

A major factor behind the drop of the relative importance of U.S. bank exposure to the LDC's has no doubt been the depreciation of the dollar since 1985. If German bank loans to the developing countries, for instance, are primarily denominated in Deutsche marks, then their dollar value rises if the dollar depreciates vis-a-vis the mark. The impact of the dollar depreciation on the relatively importance of bank creditors can easily be checked by converting the dollar commercial bank debt figures of Table 3 into the creditor nations' own currencies. Such converted exposure numbers, as reported in Table 4, show that from 1983 to 1987 British and German LDC

bank claims have risen even when measured in pounds sterling and D-marks. Since 1985, however, all the main creditor banking systems, except Italy's, have been succesful in reducing their own-currency LDC exposure.

The balance of this chapter is organized as follows. Section 2 review recent developments in the secondary market for LDC loans. It shows that secondary market prices have been on a relentless downward path, and it presents some sketchy evidence on the volume of secondary market trading of LDC loans. Section 3 looks more closely at the recent experience of the U.S. banking system with their LDC debt, extending and updating the work on this issue in Sachs and Huizinga [1987]. As noted, a main conclusion that emerges is that the solvency of the U.S. banks appears not in jeopardy at present on account of LDC debt. Section 4 replicates, as far as possible, the analysis for the non-U.S. banks. If anything, the major non-U.S. creditor banks are shown to be even less endangered by their LDC exposure than their U.S. counterparts.

Some understanding of the regulatory environment in which commercial banks now operate is necessary to be able to construct and evaluate any plans for action and reform. The tax, accounting and regulatory treatment of LDC exposure continues to differ widely internationally, even as proposals for harmonizing bank capital requirements across nations are being ratified. Some features of the creditor nations' tax and accounting rules as they relate to LDC debt are summarized in section 5. Section 6 concludes the chapter.

## 2. The secondary market for LDC loans

The secondary market for LDC loans can fulfill a number of useful purposes. It allows banks to reshuffle their portfolio's of LDC debt or to exit from LDC lending altogether, and it facilitates the execution of debt conversion schemes. Ever since secondary market prices of LDC loans were made available a few years ago, they have tended to fall. Table 5 summarizes the downward trend of secondary market prices in recent years for 27 troubled debtor countries. Columns 1 and 2 give the secondary market bid prices, as quoted by Salomon Brothers for March 11, 1986 and for June 9, 1988 Column 3 calculates the percentage change in the secondary market price between the two dates, and it shows that secondary market prices have fallen during the last 2 years for all 27 countries except Bolivia and Turkey. Of course, claims on Bolivian debt only regained some of their value from a depth of 6 cents to the dollar on news that Bolivia offered to repurchase its debt for 11 cents on the dollar in early 1988. This buy-back scheme, which was financed with donated funds and completed in March 1988, was not a reflection of the strength of the Bolivian economy but rather of the generosity of some donor governments. Turkey also has traditionally been a large recipient of outside aid. Barring these exceptions, secondary market prices thus appear to indicate that the market's perception of the debtor countries' ability to service and repay the debt has gradually worsened.

Secondary market spreads between bid and ask prices differ widely across countries, indicating substantial differences in the liquidity of the loans of the various debtor countries. Column 4 of the table reports the mean values of the spread relative to the bid price, computed as the

difference between offer and bid prices divided by the bid price. This mean spread data is based on 48 separate price quotations, with about 2 week intervals, during the period from March 11, 1986 to June 9, 1988. Discarding the fluke of a mean spread of 290 per cent for claims on Sudan, our computations show that the mean spread ranges from 1 per cent for negotiable Turkish loand to 55 per cent for rather shaky Nicaraguan loans. Mean spreads are 2 or 3 per cent for the major Latin borrowers of Argentina, Brazil, Chile and Mexico.

To explain movements in secondary market prices, Sachs and Huizinga regress the secondary market price on the following explanatory variables: debt relative to GNP, the growth rate of real GNP, dummy information reflecting a country's interest payment record and information on whether or not its loans have been judged 'value-impaired' by U.S. bank regulators. Using the growing evidence on secondary market price, it is now possible to test for the role of an additional factor: country-specific uncertainty as reflected in the volatility of the secondary market prices themselves. As in indicator or price volatity, we take the standard error of auxiliary regressions of the bid price on a linear time trend for each country.

The results of a regression which includes this standard error, denoted SE, as an explanatory variable are reported in Table 6. Other included explanatory variables are ARR, which is a dummy variable set equal to 1 if the country has commercial bank arrears as of July 1988, public debt relative to GNP, and again the growth rate of real GNP. Public debt rather than total debt relative to GNP is included, as secondary market quotations in fact primarily reflect the value of public sector obligations. The coefficient on the SE variable is negative and statististically

significant, which suggests that country-specific uncertainty indeed tends to depress secondary market prices.

While LDC loan prices have dropped, the secondary market trading volume has risen substantially. Using data provided by Salomon Brothers, Merrill Lynch and the IMF, the World Bank has managed to piece together some estimates of trading volume since 1984 for a number of debtor countries, as reflected in Table 7. Data for the years 1984, 1985 and 1986 represent only debt conversion transactions, defined as debt for equity swaps, domestic debt swaps and debt repurchases. In 1987 the heaviest secondary market trading was in Mexican bank debt at $ 4.8 billion, followed by trading in Chilean debt. Overall trading volume grew rapidly from a mere estimated $ 2 billion in 1984 to a projected trading volume of $ 35 billion for all of 1988.

As an additional measure of liquidity, one can relate the estimated volume of trading in a country's debt to the total of its commercial bank obligations. Such measures of relative trading activity are reported in Table 8. Apparently in 1987 Chilean debt was traded most intensively with trading equalling 26 percent of indebtedness . Oddly enough, the last column of the table shows that during the first half of 1988 56.8 per cent of Bolivian bank loans changed hands, which no doubt reflects the Brazilian debt buy-back of March 1988. Relative trading in Jamaican loans during the first half of 1988 was also quite robust at 20.3 per cent.

To some extent secondary market volumes reflect and parallel the debt conversion and debt buy-back schemes put in place by the various debtor countries. The pick-up of trading of Argentinian bank debt in 1987, for instance, may be in anticipation of Argentina's debt conversion project

which was formally announced on January 29, 1988.[3] The scheme calls for a total of $1.9 billion in debt to be put up for auction and converted in the next 5 years. Countries that already had debt conversion plans installed prior to 1987, such as Chile and Brazil, announced further expansions of their schemes in the form of equity funds to be capitalised with the proceeds of converted bank loans and to be invested in national industries.[4] Finally, in 1987 the Philippines set out to relax its rules for its existing debt-equity swap program following criticisms that the program was slow and stuck in red tape.[5]

3. The U.S. bank experience

The U.S. banking system remains the single largest national group of private creditor banks of the developing countries, despite its relative decline in the ranks of LDC creditor banking systems. As shown by Table 9, there has also been an absolute decline in U.S. bank exposure from a total of $ 128.3 billion at year-end of 1982 to $ 100.2 billion at the end of 1987.[6] The table shows that U.S. banking claims on private LDC borrowers have declined from $ 83.2 billion at year-end of 1982 to $ 39.9 billion at the end of 1987, while over the same period U.S. banking exposure to public institutions has in fact risen from $ 45.1 billion to $ 60.3 billion. As discussed in Sachs and Huizinga, a number of factors can account for the pronounced relative decline of the U.S. bank exposure to private borrowers in the LDC's. New money in the form of concerted lending, for instance, has primarily been extended to governments. Also, the public sectors in developing coountries have liberally granted official guarantees to previously contracted private sector debt. Finally, so far write-offs of

private debt have been more extensive than of public debt.

A second but weaker trend that is evident from the table is the continuing concentration of LDC exposure within the large money-center banks. The share of LDC loans by money-center banks has increased from 64 percent at the end of 1982 to 67 percent of the total by 1987. Apparently the smaller banks have not made any wholesale efforts to cut their LDC exposure through the secondary market. Banks in all size categories, however, have succeeded in lowering their absolute LDC exposure since 1982.

As the few largest U.S. banks are shown to hold the bulk of the LDC loans, it is warranted to examine each of them in some more detail. The LDC exposure of the 10 largest banks in the United States are given in Table 10. Citicorp tops the list with an LDC loan portfolio of over $ 13 billion, followed by BankAmerica with loans totaling roughly $ 10 billion. The 6 banks with the largest LDC exposure together hold $ 62.1 billion in LDC loans, which is approximately half of the total LDC exposure of the U.S. banks.

To gain some insight into these banks' vulnerability to LDC debt, it is useful to relate their LDC exposure to measures of bank resources. The last 3 columns of Table 10 relate the banks' developing country exposures to total bank assests, primary capital and shareholders' equity net of loan loss reserves. When dividing LDC exposure by shareholders' equity, we take the LDC exposure net of the LDC loan loss reserve.[7] Whichever of these 3 measures of relative LDC exposure one chooses, the top 4 banks in decreasing order of exposure are Manufacturers Hanover, BankAmerica, Chase Manhattan and Chemical Bank. Manufacturers Hanover and BankAmerica show high ratio's of LDC exposure to shareholders' equity of 2.63 and 2.45 respectively, even

when LDC exposure is adjusted for the already set aside LDC loan loss reserves. Citicorp, the nation's largest bank by assets, has a relatively secure LDC exposure-to-equity ratio of 1.13.

The top U.S. banks have strengthened their LDC loan loss reserves aggressively during 1987. Additions to LDC loan loss reserves for the major 10 banks are reported in Table 11. This intensified loan loss provisioning came in two distinct waves during the second and fourth quarters of the year. The first wave was heralded by Citicorp's bellwether $3 billion addition to its loan reserves on May 19, 1987, which established an informal industry-wide LDC loan loss reserve coverage standard of 25 per cent, soon to be emulated by other money-center banks. Bank of Boston, which set off the second wave of reserving in mid-December 1987, took the loan loss coverage ratio well beyond the 25 per cent resistance point. However, this time the equity poor money-center banks were not able to follow suit.

As the table shows, money-center bank write-offs of LDC debt were modest in 1987. Write-downs as a percentage of LDC outstandings for Citicorp and BankAmerica, for instance, were merely 1.6 and 2.3 per cent. Some of the banks with smaller exposure, however, decided on far more aggressive write-offs. On January 13, 1988 the American Express bank, for instance, wrote off all of its private sector LDC loans.

The impact of debt reduction schemes on bank stock prices

Debt reduction schemes are likely to produce some book losses on the part of the commercial banks. Losses arise if the current risky LDC loans are swapped for higher-quality assets with lower face value such as cash. Despite the implied book losses, such swaps may in principle benefit or harm

the banks depending on the valuation of the financial instruments they get in exchange for their LDC loans. To arrive at an informed guess as to how debt reduction schemes that involve asset swaps affect the banks, it is first necessary to infer the current value of LDC debt to the banks, as reflected in bank stock prices.

The value of LDC debt implicit in bank stock prices can in principle differ from the explicit discounts observed in the secondary market for a variety of reasons such as tax considerations, federal deposit insurance and the deficiencies of the secondary market itself. Sachs and Huizinga show, however, that the explicit discounts observed in the market and the discounts implicit in bank stock prices move together fairly closely for the period 1982 to mid-1987. An updated estimate of the discount on LDC debt implicit in bank stock prices first follows.

U.S banks are required to disclose their loan exposure to any one foreign country if it exceeds 1 per cent of book assets. Using such publicly available information, it is possible to construct a reasonably complete picture of the exposure of about 40 large banks to the five major Latin borrowers, i.e. Argentina, Brazil, Chile, Mexico and Venezuela.

The regression equation that yields us an estimate of the LDC loan discount implicit in stock prices is specified as in Sachs and Huizinga.[8] It is first premised on the identity that the market value of a bank's assets should be equal to the market value of its liabilities and of its equity. The market value of a bank's liabilities can reasonably be approximated by its book value, as most of a bank's liabilities are in fact rather short term financial instruments such as customer deposits. To facilitate the data gathering effort, the market value of preferred equity

is also proxied by its book value. Assets are taken to be assets reported on the balance sheet to the exclusion of off-balance sheet assets such the bank's contingent claim on the Federal Deposit Insurance Corporation. Some of the limitations of this omission are discussed in more detail below. Letting $\theta_1$ and $\theta_2$ stand for the market values of one dollar of LDC loans and of one dollar of non-LDC assets, we can now write the balance sheet identity as follows

$$MV_c + BV_p + BV_l = \theta_1 A_{ldc} + \theta_2 A_o$$

where

$MV_c$ = market value of common equity

$BV_p$ = book value of preferred equity

$BV_l$ = book value of liabilities

$A_{ldc}$ = book value of LDC loans

$A_o$ = book value of other assets

Both sides of the above expression can be divided by a bank's total assets, denoted by $A_{total}$, which gives the following equation to be estimated.

$$\frac{MV_c + BV_p + BV_l}{A_{total}} = \alpha + \beta \frac{A_{ldc}}{A_{total}}$$

where

$\alpha = \theta_2$

$\beta = \theta_1 - \theta_2$

In the above equation, $\alpha$ is again the market value of one dollar of non-LDC assets, and $\beta$ is the discount of LDC loans vis-a-vis non-LDC asets implicit in stock prices. The above equation is estimated using bank stock

prices for two separate dates: May 31, 1987, and also November 31, 1987. In practice, the $A_{ldc}$ variable is limited to bank loans to Argentina, Brazil, Chile, Mexico and Venezuela.[9] The regression results are reported in Table 12. Note that the constant term, which is an estimate of the market value of a bank's non-LDC assets, is very close to 1 in both regressions. The estimate of the LDC discount $\beta$ is 54 percent for November 31, 1987 and a somewhat higher 62 per cent for May 31, 1988.

Unfortunately the estimate of the discount $\beta$ is likely to be biased, as the $A_{ldc}$ variable only measures loan exposure to the big five Latin debtor nations. In particular, the estimated discount is likely to be larger than the real discount if a bank's exposure to the big Latin five is positively correlated with its other LDC bank exposure. To adjust for the bias, we need to know that U.S. banks exposure to the Latin five amounted to 67 per cent of the total LDC exposure of U.S. banks at year-end of 1987.[10] If it were true that each bank's exposure to the five Latin borrowers were perfectly correlated with other LDC exposure, then an unbiased estimate of the discount would be 67 per cent of 62, or 41. The correct discount probably lies in between 41 and 64 per cent.

Using estimates of the implicit discount thus constructed, it is possible to simulate the stock price effect of any exchange of the banks' LDC loans portfolio for cash or other securities. Let $\delta_i$ be the estimated implicit market discount so that a bank's LDC exposure, denoted Exp, currently contributes $(1 - \delta_i)$Exp to a bank's stock market value. Let us further assume that the bank sells or exchanges its LDC loans at a discount $\delta_s$, or equivalently that it receives $1 - \delta_s$ dollars in cash or marketable securities for each dollar of LDC loans. Let $r$ denote the bank's marginal

corporate income tax rate. As realized loan losses are tax deductible, the debt exchange will reduce the bank's tax liability by $\delta_s \tau$. Adding up, we see that the transaction has changed the bank's market value MV by

$$dMV = [1 - \delta_s + \delta_s \tau - (1 - \delta_i)] = [\delta_i - \delta_s(1 - \tau)]Exp$$

The initial market value of a bank, MV, can be calculated as the product of the number of stocks outstanding and the common stock price. Using the above expression for the change dMV resulting from the debt swap, we see that the relative change in a bank's stock market value is simply given by

$$\frac{dMV}{MV} = \frac{[\delta_i - \delta_s(1 - \tau)]Exp}{MV}$$

This expression thus predicts the change in a bank's stock price following a debt swap of the variety described above.

Let us take the implicit discount $\delta_i$ to be 0.41, which as discussed above is the lower bound for our regression estimate of $\delta_i$. As the above expression shows that the relative stock price change dMV/MV is positively related to the value of the implicit discount $\delta_i$, setting $\delta_i$ equal to 0.41 will give us lower bounds for the estimates of the relative stock market changes resulting from debt swaps.

The relative stock price change can easily be evaluated for any number of individual banks and different values for the variables $\delta_s$ and $\tau$. As a benchmark case for the sale discount $\delta_s$, let us take the volume weighted discount observed in the secondary market as of June 9, 1988, although there is no deep reason why actual debt swaps should be transacted at the concur-

rently observed secondary market prices. For the purpose of illustration, however, secondary market prices will suffice. As of June 9, 1988, the average secondary market discount for the 27 countries in Table 5 weighted by the exposure of all U.S. banks at year-end of 1987 was exactly 50 per cent.

There is some further ambiguity as to the appropriate tax rate $r$, as it is not clear to what extent banks will in fact be able to write off loan losses against taxable income. After the tax reform act of 1986, the top corporate rate was reduced to 34 percent.[11] However, in practice banks may be able to reduce their tax liability by less than 34 percent of loan losses if they have insufficient past, present or future taxable income to deduct realized loan losses from. At present, banks are allowed to carry such losses resulting from bad debt back for 10 years, while they can carry such losses forward for 5 years.[12] The banks' potential to carry loan losses back should be fairly easy to assess, as it is known how much tax they have actually paid in the recent past.

Corporate income taxes paid by each the 10 major U.S. banks for the 5-year period 1983-1987 are reported in Table 13. The table also calculates these taxes paid as a share of each bank's LDC loan exposure. Note that a write-off of half of the LDC debt (as in implicit in a 50 per cent sale discount) can at most reduce a bank's tax liability by the tax rate (i.e., 34 percent) times 50 or 17 cents per dollar of debt. Citicorp and Morgan are shown to have paid taxes equivalent to 25 and 27 per cent of LDC exposure, and thus appear to have sufficient loan loss carry-back potential to realize all the potential tax benefits from LDC loan write-offs. Judging from the table, Manufacturers Hanover, First Chicago, and especially

BankAmerica have somewhat more limited loan loss carry-back capabilities. However, as loan losses can be spread out for tax purposes over 15 years (rather than only 5 years), it appears that all banks can realize sizeable tax benefits following LDC debt write-offs.

The final piece of information we need is estimates of the top 10 banks' market capitalizations, MV, as reported in Table 14. The second column of the table divides LDC loan exposure by market capitalization to arrive at values of the ratio Exp/MV.[13] At this point we have all the information necessary to evaluate stock price changes resulting from a debt swap. The discount $\delta_s$ is taken to be 0.50 throughout. As there remain some ambiguity what the appropriate tax rate is, and we do the evaluations for four different values of the tax rate: 0.34, 0.20, 0.15 and 0. The results, tabulated in Table 17 indicate that for tax rates of 0.34 and 0.20 all 10 major banks will see there stocks rise in value, while for tax rates of 0.15 and 0 stock prices for all banks go down. Not surprisingly, the stock prices of the most heavily exposed banks (such as BankAmerica and Manufacturers) are most affected by any swap.

Using the expression for dMV/MV, we can also derive the threshold sale discount $\delta_s$ that causes a bank to have a zero market value for any given tax rate $\tau$. In symbols, this critical discount is found by setting dMV/MV equal to -1. The table reports these border line discounts $\delta_s$ for the top 10 banks for each of the tax rates 0.34, 0.20, 0.15 and 0. Obviously, the higher the tax rate $\tau$ the larger the discount $\delta_s$ that a bank can sustain without reaching zero market value. The table shows that with a tax rate of 0.34 only BankAmerica and Manufacturers Hanover will reach the folding point for unrealistically high critical discounts of 88 and 86 per

cent respectively. Even for the hypothetical case of zero tax rates, which implies there is no tax deductibility of loan losses, only a limited number of banks can theoretically reach the zero value mark for critical discounts that in all cases are larger than the currently observed average secondary market discount of 50 per cent. This indicates that little short of the LDC loans becoming completely worthless can push the major U.S. banks over the edge.

How costly are any such debt reduction scheme to the U.S. tax payers in the form of foregone tax receipts? These costs can easily be computed as $\delta_s rEXP$. For a total U.S. bank exposure of $ 100.2 billion from Table 9, the U.S. Treasury would forego about $17 billion in tax revenue. It is not clear, however, whether any coordinated large scale debt swap will greatly affect total foregone tax receipts over time. As a number of developing countries certainly won't be able to service their debts fully under any circumstances, the U.S. banks will register LDC loan losses at some point no matter what. Perhaps the major effect of a large sell-off of LDC debt by the banks is that write-offs, which would otherwise be spread out over many years, are bunched at the time of the swap.

Caveats

As noted earlier, the specification of regression equation that yields our estimate of the implicit discount does not capture the valuation of a bank's off-balance sheet assets such as the value is off-balance sheet banking operations and the bank's contingent claim on the Federal Deposit Insurance Corporation. There are two reasons why the value of the latter claim may be expected to rise as the value of LDC loans declines: (1) there

will be a widening gap between the fixed priced deposit insurance and the true or actuarial value of deposit insurance and (2) bank regulators may prove to be reluctant to actually close down the very large banks, certainly if they become troubled all at the same time; this means that a bank, which is practically insolvent, will still have a positive chance of making a return and thus a positive market value.[14]

Consistent with this observation, Brickley and James [1986] find that there was a significant decrease in the co-movement of savings and loans stock returns with the returns of the underlying assets held by these institutions following a relaxation of regulatory rules regarding when savings and loans institutions are to be closed. Thus the regulatory safety net may partially mitigate the impact of larger actual or expected LDC loan losses on bank stock prices, and thus the numbers in Table 17 may overstate any negative impact of debt swaps on bank stock returns. As a related matter, Unal and Kane [1987] show that the relationship between off-balance sheet assets (including federal guarantees) and interest rates has been unstable and changed sign during the 1975-1986 period.

The value of FDIC insurance to a bank is uncertain not only because bank regulators have considerable latitude in deciding when to close down a bank, but also because it is uncertain to what extent the FDIC will protect the banks' deposit holders, debt holders, and shareholders in case of a bank failure. While FDIC insurance only guarantees deposits of under $ 100,000, the FDIC in some cases has protected and reimbursed all depositors. In fact, all depositors in both the failures of Continental Illinois in 1984 and of First RepublicbankBank in 1988 were fully paid off. In federal bailouts, bank bondholders have also received settlements

ranging from 100 per cent to virtually nothing as in the recent First RepublicBank case.

There are a also couple of reasons why debt swaps and the implied loan losses can negatively influence the return to bank shareholders that are not quantified in our regression equation either. First, the realization of loan losses implies adverse announcements of company earnings, which have historically tended to produce negative stock price reactions. Second, the fall in book capital that follows the realization of loan losses may prompt more frequent and costly bank examinations by the regulatory agencies. Third, a shortage of bank capital may force the bank to issue additional stock, which dilutes and negatively influences the interest of the original stock holders. Table 17 understates any potential negative impact of debt swaps on stock prices to the extent that these effects are sizeable.

The Brazilian moratorium

Banks remain to some extent vulnerable to the vicissitutes of LDC debt, as was shown by the Brazilian interest moratorium announced on February 20, 1987. Using the event study method, Sachs and Huizinga have shown that the announcement of interest moratorium by Brazil adversely affected bank stock prices. Using the same technique, Bruner and Sims [1987] had earlier shown that bank stock returns have been negatively affected by the announcement by Mexico in August 1982 that it could not fully service its debt. Özler [1988] finds that debt reschedulings also materially affect bank stock value. Brazil's interest suspension was the major impetus behind Moody's decision to downgrade the credit ratings of most of the major banks - among them Citicorp, BankAmerica, and Chase Manhattan - in early December 1987.

As Moody put it, there was a "reduced commitment of borrowers to austerity programs" and a "sharp fall in secondary market prices for third world debt."[15]

Negotiations that eventually lead to the cessation of the moratorium intensified in October 1987 with the aim of warding off a decision by U.S. bank regulators, meeting in Washington from October 26, to reclassify Brazilian loans as "value-impaired". Such a downgrading would make it much more difficult for Brazil to obtain additional credit, as private creditors would have to reserve immediataly at least 10 per cent for any new loan to Brazil. Throughout the negotiations, Brazil continued to make concessions to the banks. The bank stock return regression in Table 16, which spans the period from December 15, 1987 to May 31, 1988, reveals that the outcome of the negotiations was far better for the banks than bank stock investors could have hoped for. The positive coefficient of 0.612 indicates a significant revaluation of Brazilian loans during the preceding half a year. In a parallel fashion, the secondary market price for Brazilian loans rose from a low point of 38 cents on October 6, 1987 to 54.5 cents on May 26, 1988.[16]

Despite the large transfer of wealth from the Brazil to the banks implicit in the resurgence of bank stock prices after October 1987, president Sarney of Brazil publicly confessed that the moratorium had been a mistake in early February 1988, at the time Brazil made its first post-moratorium interest payment of $350 million. Sarney said that the interest suspension had caused Brazil to miss out on interest rate reductions accorded to other debtor countries, and that financial flows from the country had grown, while inward investment and export credits from foreign

governments had stagnated.[17] These immediate drawbacks of the moratorium no doubt are real enough, but their magnitude appears negligible compared to the massive transfer of wealth implicit in the rise in bank stock prices and the surge in the secondary market price of Brazilian debt after the moratorium had ended.

4. Major non-U.S. creditor banks

Non-U.S. creditor banks hold the majority of commercial bank claims on LDC's. Japan and the Europan countries have banking systems that are highly concentrated within a few large banks, which in principle could made these banking systems more vulnerable to LDC debt than the U.S. banking system. Unfortunately, the major non-U.S. banks aren't subject to the stringent disclosure requirements that apply to U.S. banks, and thus data on, for instance, the LDC exposure of individual banks is more restricted. Exposure data for the main Canadian and British banks, however, has been fairly well publicized. The LDC portfolio's of German, French and Japanese banks, however, are still strictly off-the-record. Interestingly, it is the banking systems with relatively low LDC exposure that have restricted public access to LDC exposure data. Maybe this reflects the fact that low-exposure banks wish to conceal their true exposure - and the fact that LDC exposure poses no threat to them - to strengthen their bargaining position in the rescheduling arena.

As exposure data for only a few top non-U.S. banks - and then only to Brazil and Mexico - is available, it is not possible to estimate the discounts on LDC debt implicit in bank stock prices for the non-U.S. creditor banking systems individually. Implicit discounts can in principle

differ internationallly for a number of reasons, such as international differences in taxation and accounting practices. LDC debt write-offs, for instance, are more valuable to banks in high-tax countries than to banks in low-tax countries, because in the former write-offs imply more sizeable reductions in the banks' tax liabilities.

As it is not possible to estimate implicit LDC discounts independently for each of the creditor countries, our approach is instead to see how heavily exposed the top non-U.S. banks are (relative to bank resources) compared with their U.S. counterparts. The non-U.S creditor creditor nations we examine are Canada, France, Germany, Japan and the United Kingdom. The LDC exposure of these countries' top banks to Brazil and Mexixco relative to either bank assets, equity or market capitalization on the whole turns out to be lower than for the top U.S. banks on the whole. Trusting that implicit discounts on LDC debt and tax provisions aren't too dissimilar across countries, we can reasonably conclude that the non-U.S. banks are in less danger of crumbling under the weight their LDC portfolio's than the U.S. banks.

The high degree of concentration of LDC debt in Europe and Japan is apparent from Table 17, which computes the Mexican exposure of a country's top five banks as a share of the country's banking system's total exposure to Mexico.[18] The numbers indicate that Mexico's bank debt is even more heavily concentrated among a few banks in the United Kingdom, Canada, France and West Germany than in the United States. In Japan the five major banks hold a still impressive 39 percent of the country's commercial bank exposure to Mexico. These numbers warrant a focus the creditor nations' major banks.

Information on each of the individual banks in the major creditor countries is provided in Table 18. Column 1 shows the banks' ratios of equity to total assets. This simple measure of capital adequacy shows that the major British and Canadian banks are on average as well capitalized as the chief American banks. The top Japanese and French banks, however, have rather low average equity-to-assets ratio's of 2.3 and 2.6 per cent respectively. These banks' equity falls well short of the 4 per cent minimum standard for shareholders' equity as a percentage of risk assets that will be in force in each of the creditor nations mentioned here.[19] Columns 2 and 3 of the table state the banks' exposure to Mexico as a percentage of total assets and as a percentage of bank equity. Columns 4 and 5 do the same for the banks' combined exposure to Brazil and Mexico, as far as the data allows.

The numbers show that only Lloyds and Midland banks in the United Kindom and the Bank of Montreal in Canada are as heavily exposed to Brazil and Mexico as the top U.S. banks. Note that exposures relative to assets for the top Japanese, French and German banks are substanstially lower. Japanese exposures relative to bank resources have no doubt declined substantially in recent years as Japanese banks have expanded rapidly, partly because of the appreciation of the yen. As of year-end 1987, all of the world's 10 largest banks, based on deposits, were in fact all Japanese.[20]

How would the major non-U.S. banks fare if their debt were sold at a discount as part of a debt reduction scheme? The answer, as in the case of the U.S. banks, depends on

(1) the current LDC discount implicit in bank stock prices,

(2) the potential tax benefits of write-offs,

(3) the extend of exposure relative to bank market capitalization,

(4) the operation of deposit insurance and other regulatory safeguards.

Information on bank exposure (to Brazil and Mexico) relative to market capitalization is easily computed. Table 19 gives this information for the top British, Canadian and Japanese banks for which data is available. If we are willing to assume that implicit LDC discounts and tax regulations aren't too different across countries, then we know from our previous discussion that a debt swap's impact on bank stock returns, dMV/MV, is proportional to the ratio of LDC exposure to market capitalization, Exp/MV . Table 19 shows that exposure-to-market value ratio's tend to be lower for the British, Canadian and especially the Japanese banks than for the top U.S. banks. In fact LDC exposures relative to market capitalizations are virtually nil for the top Japanese banks. Thus it follows that cash sales of LDC debt affect bank stock prices of British, Canadian and Japanese banks less than the stock prices of U.S. banks. Only the stock price of Midland Bank in the United Kingdom would be affected to about the same extent as those of the top U.S. banks. For the Japanese banks, the debt crisis can at best produce a small ripple in bank stock returns prices. If the many short-cuts that underly this reasoning are accepted, then we can conclude that the major non-U.S. banking systems are even less jeopardized by the debt crisis than the U.S. banking system.

As in the United, deposit insurance in the other major creditor nations may mitigate the link between stock returns and the value of LDC debt. A 1977 European Community directive requires the Community's member countries to establish deposit protection schemes.[21] As a response, the 1979 Banking

Act in the United Kingdom provides partial deposit protection for deposits up to 10,000 pounds sterling. To pre-empt such legislation in Germany, the German private commercial banks established their own deposit protection scheme in 1976. The scheme is not well-funded and relies on the support of the contributory banks in case of a major bank failure. Previously, deposit protection was established in Japan in 1977. The Japanese protection fund is also small and offers only limited protection to individual depositors. Thus while the European countries and Japan do have deposit insurance, the coverage and subsidies inherent in these schemes appear to be small compared to federal deposit insurance in the United States.

5. Taxation, accounting and other regulations

Banks are subject to a variety of tax, accounting and other regulatory provisions that directly affect the profitability of their foreign loans, and thus their ability to weather the debt crisis. As these regulations have evolved independently at the national level, they tend to vary widely internationally. This regulatory diversity makes it difficult even for the banks among themselves to reach a consensus as to how best to resolve the debt crisis. Indeed, differences in the responses of U.S. and Japanese banks to, for instance, Mexico's early 1988 proposal to exchange some of its bank debt for bonds can be traced partly to differences in accounting rules. As large-scale LDC debt write-offs would cut deeply into a bank's capital and its ability to continue business as usual, willingness on the part of the banks to embrace any such scheme depends in part on wether it involves substantial write-offs. In the case of the Mexican offer, the Japanese Ministry of Finance ruled that Japanese banks did not have to write

down the value of Mexican loans remaining on the balance sheet. Moreover, the Finance Ministry was expected to allow the inclusion of loan losses stemming from the conversion into tax calculations.[22] The Security and Exchange Commission, on the other hand, stated that increases in loan loss reserves or write-downs of remaining Mexican debt were required. As a result the Japanese banks were relatively enthusiastic about the Mexican deal.

An important way in which bank regulators affect a bank's ability to weather its LDC debt situation is through minimum capital requirements. Recently, 12 countries agreed upon common capital standards to be adopted by 1992 within the framework of the Basle Committee on Bank Regulations and Supervisory Practices.[23] The goal of the international harmonization of capital requirements is to iron out competitive inequities across boundaries that arise from different capital requirements across countries, and to create an "even playing field" internationally.

As was the case in the individual countries, the new capital adequacy rules are based on the book values of capital and assets. The agreed minimum capital standard is 8 per cent of risk assets. At least half of the bank capital has to consist of shareholders' equity, retained earnings or noncumulative preferred stock. The remainder can include undisclosed reserves, asset revaluation reserves (only 45 per cent of unrealized gains can be counted), loan loss provisions (up to a maximum of 1.25 per cent of risk assets), and various hybrid capital instruments and subordinated debt.[24] These various provisions represent negotiated compromises that reflect pre-agreement international differences in the definition of bank capital. The partial qualification of unrealized holding gains as capital,

for instance, is meant to accommodate the Japanese financial institutions that at present carry substantial unrealized gains. The partial gearability of loan loss reserves, on the other hand, assists the French and U.S. banks that at present can count loan loss reserves towards capital.

According to news reports, the new capital standards call for substantial rises in capital for the Japanese and French banks, while the U.K. banks would not see significant changes in their present position.[25] The Japanese banks are estimated to have to come up with an additional $35 billion in capital by 1992. Federal Reserve Board officials in the United States hinted that 5 unidentified U.S. banks need an extra $ 12 to $ 15 billion in additional capital by 1992 to be in compliance with the newly adopted standards.[26] As noted, if new capital guide lines cause bank capital to be in short supply, then banks may prove to be more reluctant to write off their LDC loans, and participate in debt reduction schemes that involve write-downs beyond current reserving levels. A dearness of capital will more generally limit the banks' ability to provide new lending at home at well as abroad.

The Basle agreement also provides for rules regarding the risk-weighting of assets which could prove as important to the developing countries as overall capital requirements. The lower risk weighting attached to lending to OECD government (including Saudi-Arabia) than to lending to non-OECD governemnts could discourage banks from extending credit to the public sector debt in developing countries. The equal risk-weighting of private sector debt in OECD and non-OECD countries alike, however, precludes a bias in bank lending to either developed or developing countries.

Unfortunately uniform international capital standards and risk weightings of assets by themselves do not guarantee fair international competition among the banks. Given the persisting international diversity in tax and accounting practices, the harmonization of capital standards in itself is as likely to exacerbate as to alleviate unfair banking competition. The continuing international discrepancies in tax and accounting practices may also have some unintended and unforeseen consequences for the banks' debt crisis management other than unfair interbank competition. Banks may, for instance, use the secondary market for LDC loans to rearrange their international LDC loan portfolio's in an effort to arbitrage international differences in tax and accounting rules. The secondary market can thus be a vehicle for directing LDC loans to those countries where they carry the greatest tax relief to the banks. If this were to happen, then the tax payers of the various creditor countries would face rather unequal burdens in foregone corporate income tax receipts. At this point, direct evidence that the banks are in fact reshuffling their LDC portfolio's via the secondary market to reap maximum tax benefitts is not available. The evidence on the aggregate exposures of creditor banking systems in Tables 3 and 4, however, is suggestive. German banks, which in recent years have expanded their LDC exposure relative to other creditors, indeed enjoy a favorable tax treatment of LDC loan loss provisions and, as discussed below, have a correspondingly high LDC loan loss reserve coverage.

As the debt crisis unfolds, tax and accounting rules are gradually crystalizing where there is still uncertainty. Experiments such as the recent Mexican offer, whether succesful or not, help to force bank regulators to provide regulatory clarity, and to state explicitly what until

then was only informal. The banks themselves are important participants in this evolution of regulatory practices. Citicorp's $ 3 billion provision for loan losses in May 1987, for instance, set an implicit LDC loan loss reserve coverage standard of 25 that was quickly followed by other major banks. Regulators, when enunciating new rules, no doubt often look attentatively at what leading banks and accounting firms have already been practicing.

The major features of accounting and tax regulations regarding loan loss provisioning in the chief creditor nations are surveyed in Table 23. The first column indicates the current levels of provisioning in the major creditor nations. Of the 7 national banking groups, the German banks appear to have reserved most heavily against LDC loan losses, while Japanese banks stands out for their low level of provisioning. The second column of the table summarizes whether and to what extent provisioning has been mandatory. France and Germany have not prescribed any binding guidelines as to the appropriate level of provisioning for LDC loan losses. In the United States, the bank regulatory bodies require a loan loss reserve level of at least 10 per cent for a number of countries whose loans have been declared "value-impaired." Canada, Japan, Switzerland and the United Kingdom, on the other hand, have drawn up rather elaborate matrices of countries for which reserving is necessary and the corresponding minimum provisioning levels. Banks generally have already reserved beyond the mandatory reserving levels, especially in West-Germany. Deutsche Bank AG, for instance, had set aside reserves for 70 percent of its LDC loans as of September 1987 according to its chief Afred Herrhausen.[27]

At least partial deductibility of loan loss provisions for corporate

income tax purposes is allowed in all the major creditor nations except the United States. The Japanese, however, limit the tax deductibility of provisioning to just 1 per cent of rescheduled debt or inceased exposure. A final regulatory issue is whether loan loss reverves are counted towards bank capital. As summarized in the last column of the table, loan loss reserves currently do not qualify as regulatory bank capital in Canada, Germany, Switzerland and the United Kingom. In Japan only 1 percent of rescheduled debt or increased exposure can be reckoned as capital. At present France and the United States allow loan loss reserves to be fully counted towards bank capital. As noted the Basle agreement will introduce a limited role for loan loss reserves as capital in all the major creditor nations by 1992.

## 6. Conclusion

This chapter has examined the experience of commercial banks in a number of creditor nations with developing country debt. For the case of the U.S. banks, we find that at present bank stock prices already reflect a high discount of LDC debt. Thus the stock prices of U.S. banks are not expected to fall if the banks get a return on their LDC loans roughly consistent with the prices for LDC loans currently observed in the secondary market. This in fact implies the banks have weathered the debt crisis. The top banks in Canada, France, Japan, the United Kingdom and West-Germany are shown to be equally or less heavily exposed to LDC debt than their U.S. counterpart, and thus to be correspondingly less imperiled by the debt crisis than the U.S. banks.

It remains to be seen whether the commercial banks' current strength

and stability will prove to be helpful in reestablishing normal credit relationships between the private banks and the developing countries. While it may take time, a combination of self-interest and public policy should in the end be able to overcome the current impasse in the debt crisis. Large scale debt swaps sponsored by some private or public agency is one means that, as we have shown, the banks can withstand very well. At present, the same strategy is already implemented bilaterally in small steps and in a variety of guises such as debt conversions and debt buy-backs.

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Table 1. Commercial bank debt of developing countries by geographic region at the end of 1987 (billions of U.S. $).

| | |
|---|---|
| Africa | 61.2 |
| Latin America | 256.6 |
| Asia | 134.8 |
| Middle East | 58.2 |
| Other Europe | 49.7 |
| Eastern Europe | 84.0 |
| All LDC borrowers | 644.4 |

Country data source: BIS, Quarterly Release. Country groupings are the World Bank's and based on the geographical breakdown as used by the OECD.

Table 2. Commercial bank claims on the highly indebted countries at the end of 1987 (billions of U.S. $).

| | |
|---|---|
| Argentina | 34.2 |
| Bolivia | 0.6 |
| Brazil | 81.0 |
| Chile | 12.9 |
| Colombia | 6.2 |
| Costa Rica | 0.9 |
| Cote d'Ivoire | 3.5 |
| Ecuador | 5.0 |
| Jamaica | 0.5 |
| Mexico | 74.4 |
| Morocco | 5.7 |
| Nigeria | 10.8 |
| Peru | 5.1 |
| Philippines | 14.3 |
| Uruguay | 2.1 |
| Venezuela | 25.0 |
| Yugoslavia | 10.0 |
| Total | 292.2 |

Source: BIS, Quarterly Release.

Table 3. Distribution of LDC bank loans among creditor nations (billions of U.S. $).

| | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| United States | | 142.2 | 137.2 | 133.5 | 128.8 (Q4) |
| United Kingdom | 89.4 | 89.1 | 100.8 | 104.8 | 105.1 (Q3) |
| Germany | 26.9 | 25.5 | 34.7 | 44.8 | 54.7 (Q4) |
| France | | 55.8 | 59.2 | 65.2 | 65.2 (Q3) |
| Switzerland | | 13.4 | 16.6 | 19.4 | |
| Italy | | | | 5.8 | 7.1 (Q2) |
| Total | | | 563.4 | 601.8 | 644.4 (Q4) |

Sources: National statistical publications, as reported in the 'Financial Flows to Developing Countries, Quaterly Review,' September 1988, World Bank. The data is on a territorial basis and non-consolidated. The large numbers for the U.K. may reflect LDC lending by branches of non-U.K. banks located in London. The U.S. data is from the Department of the Treasury.

Table 4. Distribution of LDC bank loans among creditor nations measured in billions of the creditor countries' currencies.

| | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| United States ($) | | 142.2 | 137.2 | 133.5 | 128.8 (Q4) |
| United Kingdom (pounds) | 59.0 | 66.7 | 77.8 | 71.5 | 65.0 (Q3) |
| Germany (DM) | 68.8 | 72.7 | 102.0 | 97.3 | 93.3 (Q4) |
| France (FF) | | 487.8 | 532.0 | 451.7 | 392.7 (Q2) |
| Switzerland (SW) | | 31.3 | 40.9 | 34.9 | |
| Italy (lires) | | | | 8713.7 | 9162.9 (Q2) |

Sources as for Table 3.

Table 5. Secondary market prices and spreads.

| Country | Bid Price at 3/11/86 | Bid Price at 6/9/88 | Perc. Change | Mean Relative Spread |
|---|---|---|---|---|
| Argentina | 64 | 26 | -59 | 3 |
| Bolivia | 5 | 11 | 120 | 24 |
| Brazil | 75 | 52.5 | -30 | 2 |
| Chile | 67 | 60 | -10 | 3 |
| Colombia | 84 | 65 | -23 | 3 |
| Costa Rica | 53 | 11 | -79 | 12 |
| Dom. Republic | 45 | 20 | -56 | 9 |
| Ecuador | 68 | 27.5 | -60 | 5 |
| Honduras | 40 | 22 | -45 | 10 |
| Ivory Coast | 74 | 28.5 | -61 | 6 |
| Jamaica | 45 | 39 | -13 | 11 |
| Mexico | 60 | 51.75 | -14 | 2 |
| Morocco | 68 | 49 | -28 | 3 |
| Nicaragua | 4 | 2 | -50 | 55 |
| Nigeria | 55 | 28 | -49 | 9 |
| Panama | 73 | 24 | -67 | 8 |
| Peru | 19 | 6 | -68 | 29 |
| Philippines | 57 | 53.5 | -6 | 3 |
| Poland | 53 | 42 | -21 | 3 |
| Romania | 92 | 85.5 | -7 | 2 |
| Senegal | 70 | 40 | -43 | 5 |
| Sudan | 10 | 2 | -80 | 290 |
| Turkey | 97 | 98 | 1 | 1 |
| Uruguay | 63 | 60 | -5 | 3 |
| Venezuela | 79 | 55.5 | -30 | 2 |
| Yugoslavia | 84 | 45 | -46 | 3 |
| Zaire | 25 | 19 | -24 | 18 |

Data Source: Salomon Brothers.
Note. The mean relative spread is calculated as the mean of the difference between the ask and bid prices divided by the bid price.

Table 6. A regression of secondary market prices.

| | |
|---|---|
| C | 82.281 |
| | (12.52) |
| ARR | -15.520 |
| | (-6.39) |
| PD/GNP | -0.232 |
| | (-4.55) |
| GNPGROWTH | 1.300 |
| | (1.30) |
| SE | -2.111 |
| | (-4.12) |
| N 25 | |
| $R^2$ 0.81 | |

Note. ARR is a dummy for commercial bank arrears.
PD/GNP is public debt as a percentage of GNP
GNPGROWTH is the growth rate of real GNP.
SE is standard error of regression of the bid price on linear time trend.
The secondary market prices are a cross-section for June 9, 1988. Parentheses indicate t-statistics.

Table 7. Debt swaps 1984 - 1988 (millions of U.S. $).

| | 1984[a] | 1985[a] | 1986[a] | 1987[a] | 1987[b] | 1988[a]* |
|---|---|---|---|---|---|---|
| Debt Conversions[a] | | | | | | |
| Argentina | 31 | 469 | | | 750 | 338 |
| Brazil | 731 | 537 | 176 | 380 | 1250 | 2708 |
| Bolivia | | | | | | 349 |
| Chile | | 324 | 987 | 1983 | 3500 | 583 |
| Costa Rica | | | 7 | 92 | | |
| Ecuador | | | | 125 | | 102 |
| Honduras | | | | 6 | | |
| Jamaica | | | | 1 | | 102 |
| Mexico | | | 416 | 1804 | 4750 | 3670 |
| Peru | | | | | | 15 |
| Poland | | | | | 150 | |
| Philippines | | | 15 | 266 | 450 | 635 |
| Venezuela | | | | | 650 | 300 |
| Other | | | | | 500 | |
| Total | 762 | 1330 | 1601 | 4710 | | 8837 |
| Debt Swaps[b] | 2000 | 4000 | 7000 | | 12000 | 35000[c] |

Note. * January - June 1988.
a. Debt for equity or domestic debt swaps and debt repurchases.
b. Debt swaps, all transactions, including interbank transactions.
c. Estimate for all of 1988.
Source: Financial Flows to Developing Countries, Quaterly Review, September 1988, World Bank.

Table 8. Debt swaps as percentages of bank claims on the debtor country 1984 - 1988.

| | 1984[a] | 1985[a] | 1986[a] | 1987[a] | 1987[b] | 1988[a]* |
|---|---|---|---|---|---|---|
| Debt Conversions[a] | | | | | | |
| Argentina | 0.1 | 1.6 | | | 2.3 | 1.0 |
| Brazil | 1.0 | 0.7 | 0.2 | 0.5 | 1.5 | 3.3 |
| Bolivia | | | | | | 56.8 |
| Chile | | 2.3 | 7.0 | 14.4 | 26.4 | 4.4 |
| Costa Rica | | | 0.8 | 16.9 | | |
| Ecuador | | | | 2.4 | | 2.0 |
| Honduras | | | | | | |
| Jamaica | | | | 0.2 | | 20.3 |
| Mexico | | | 0.6 | 2.0 | 6.3 | 4.9 |
| Peru | | | | | | 0.3 |
| Poland | | | | | | |
| Philippines | | | 0.1 | 2.0 | 3.2 | 4.7 |
| Venezuela | | | | | 2.6 | 1.2 |

Note. * January - June 1988.
a. Debt for equity or domestic debt swaps and debt repurchases.
b. Debt swaps, all transactions, including interbank transactions.
Sources: as Table 7; Debt data applied to 1987 and 1988 volume data is for the third quarter of 1987 from the BIS, Quaterly Release.

Table 9. The LDC exposure of U.S. commercial banks: a trend towards more public sector debt (billions of U.S. $).

| | End 1982 | | |
|---|---|---|---|
| | Public | Private | Total |
| Top 9 Banks | 33.3 | 48.7 | 82.0 |
| All Other banks | 11.8 | 34.5 | 46.3 |
| Total | 45.1 | 83.2 | 128.3 |
| | **Mid 1985** | | |
| | Public | Private | Total |
| Top 9 Banks | 40.1 | 41.2 | 81.3 |
| All Other banks | 18.3 | 25.8 | 44.1 |
| Total | 58.4 | 67.0 | 125.4 |
| | **End 1987** | | |
| | Public | Private | Total |
| Top 9 Banks | 42.6 | 24.5 | 67.1 |
| All Other banks | 17.7 | 15.4 | 33.1 |
| Total | 60.3 | 39.9 | 100.2 |

Source: Federal Financial Institutions Examinations Council, "Country Exposure Lending Survey." End-1982 data from statistical release of June 1, 1983, Mid 1985 data from statistical release of October 15, 1984; Mid 1985 data from statistical release of November 6, 1985. End 1987 data from statistical release of April 22, 1988.
Exposures are by residence of borrower. LDC exposure is calculated as the sum of exposures to Opec, Non-oil Latin America, Non-oil Asia, and Non-oil Africa.

Table 10. LDC exposure of large U.S. banks at year-end 1987.

| | LDC exposure (millions of dollars) | LDC exposure as percentage of assets | LDC exposure/ primary capital | LDC exposure net of loan loss reserve/ shareholders' equity |
|---|---|---|---|---|
| Citicorp | 13,300 | 6.5 | 0.79 | 1.13 |
| BankAmerica Corp. | 10,000 | 10.8 | 1.24 | 2.45 |
| Chase Manhattan | 8,600 | 8.7 | 1.12 | 1.71 |
| Man. Hanover | 8,900 | 12.1 | 1.45 | 2.63 |
| J.P. Morgan & Co. | 5,400 | 7.2 | 0.74 | 0.81 |
| Chemical NY | 5,904 | 7.6 | 0.97 | 1.51 |
| Security Pacific | 2,200 | 3.0 | 0.39 | 0.36 |
| First Interstate | 1,359 | 2.7 | 0.36 | 0.34 |
| Bankers Trust NY | 4,000 | 7.1 | 0.80 | 1.04 |
| First Chicago | 2,900 | 6.6 | 0.75 | 0.98 |

Source: Review of Bank Performance, Salomon Brothers, 1988 edition.

Table 11. LDC loan loss reserves and charge-offs for major U.S. banks at year-end 1987.

| | LDC reserve established in 2Q (millions) | LDC reserve established in 4Q (millions) | total LDC loan loss reserve (millions) | LDC loan loss reserve coverage (per c.) | Charge -off in 1987 (millions) |
|---|---|---|---|---|---|
| Citicorp | 3,000 | - | 3,325 | 25 | 214 |
| BankAmerica Corp. | 1,100 | - | 2,004 | 20 | 234 |
| Chase Manhattan | 1,600 | - | 2,000 | 25 | 78 |
| Man. Hanover | 1,700 | - | 1,787 | 22 | 63 |
| J.P. Morgan & Co. | 850 | - | 1,330 | 25 | 149 |
| Chemical NY | 1,100 | - | 1,360 | 25 | 21 |
| Security Pacific | 558 | 350 | 980 | 54 | 78 |
| First Interstate | 500 | 180 | 612 | 54 | 150 |
| Bankers Trust NY | 700 | - | 1,000 | 25 | 55 |
| First Chicago | 780 | 240 | 1,132 | 39 | 91 |

Source: Review of Bank Performance, Salomon Brothers, 1988 Edition.

Table 12. Asset value regression results.

| Date | Constant | Exp/Assets | $R^2$ | N |
|---|---|---|---|---|
| November 30, 1987 | 0.998 | -0.541 | 0.33 | 41 |
| | (232.50) | (-4.36) | | |
| May 31, 1988 | 1.007 | -0.617 | 0.36 | 41 |
| | (222.99) | (-4.63) | | |

Note. The dependent variable is the sum of the market value of common stock and the book values of preferred stock and total liabilities, divided by total assets, computed as the sum of book assets and loan loss reserves. Exp/Assets stands for exposure to Argentina, Brazil, Chile, Mexico and Venezuela divided by assets, calculated as mentioned. Parentheses indicate t-statistics.

Table 13. Income taxes paid by major U.S. banks.

| | income taxes paid 1983 - 1987 (millions) | income taxes paid/ LDC exposure |
|---|---|---|
| Citicorp | 3,337 | 0.25 |
| BankAmerica Corp. | 594 | 0.06 |
| Chase Manhattan | 741 | 0.09 |
| Man. Hanover | 708 | 0.08 |
| J.P. Morgan & Co. | 1,457 | 0.27 |
| Chemical NY | 353 | 0.16 |
| Security Pacific | 461 | 0.34 |
| Bankers Trust NY | 597 | 0.15 |
| First Chicago | 223 | 0.08 |

Source: Review of Bank Performance, Salomon Brothers, 1988 Edition.

Table 14. Market capitalizations large U.S. banks.

| | Market value of of common stock (millions) | LDC exposure/ market value |
|---|---|---|
| Citicorp | 7,508 | 1.77 |
| BankAmerica Corp. | 1,701 | 5.88 |
| Chase Manhattan | 2,189 | 3.93 |
| Man. Hanover | 1,408 | 6.32 |
| J.P. Morgan & Co. | 6,547 | 0.82 |
| Chemical NY | 1,581 | 3.73 |
| Security Pacific | 3,829 | 0.57 |
| First Interstate | 2,121 | 0.64 |
| Bankers Trust NY | 2,607 | 1.53 |
| First Chicago | 1,520 | 1.91 |

Note. Bank market value is calculated as the product of the stock price at May 31, 1988 and the number of stocks outstanding at year-end 1987. Data source: Review of Bank Performance, Salomon Brothers, 1988 Edition.

Table 15. Simulations of cash sales of LDC loans by U.S. banks.

| | Case 1: 34 per cent tax. | | Case 2: 20 per cent tax. | |
|---|---|---|---|---|
| | change in stock price | critical discount | change in stock price | critical discount |
| Citicorp | 14 | - | 2 | - |
| BankAmerica Corp. | 47 | 88 | 6 | 72 |
| Chase Manhattan | 31 | - | 4 | 83 |
| Man. Hanover | 51 | 86 | 6 | 71 |
| J.P Morgan & Co. | 7 | - | 1 | - |
| Chemical NY | 30 | - | 4 | 84 |
| Security Pacific | 5 | - | 1 | - |
| First Interstate | 5 | - | 1 | - |
| Bankers Trust NY | 12 | - | 2 | - |
| First Chicago | 15 | - | 2 | - |

| | Case 3: 15 per cent tax. | | Case 4: 0 per cent tax. | |
|---|---|---|---|---|
| | change in stock price | critical discount | change in stock price | critical discount |
| Citicorp | -3 | - | -16 | 97 |
| BankAmerica Corp. | -9 | 66 | -53 | 58 |
| Chase Manhattan | -6 | 78 | -35 | 66 |
| Man. Hanover | -9 | 67 | -57 | 57 |
| J.P Morgan & Co. | -1 | - | -7 | - |
| Chemical NY | -6 | 80 | -34 | 68 |
| Security Pacific | -1 | - | -5 | - |
| First Interstate | -1 | - | -6 | - |
| Bankers Trust NY | -2 | - | -14 | - |
| First Chicago | -3 | - | -17 | 93 |

Table 16. Excess return regression.

| C | BRA | OTHER | $R^2$ | N |
|---|---|---|---|---|
| 0.042<br>(1.09) | 0.612<br>(2.18) | -0.247<br>(-1.70) | 0.17 | 39 |

The dependent variable is the percentage stock price appreciation minus the bank's beta times the percentage appreciation of the S & P 500 stock index.
BRA is exposure to Brazil divided by shareholders' equity.
OTHER is exposure to Argentina, Chile, Mexico and Venezuela divided by shareholders' equity. Parentheses indicate t-statistics

Table 17. Exposure to Mexico of 5 top banks as percentage of creditor banking system's total exposure to Mexico.

| | | date |
|---|---|---|
| United Kingdom | 69 | 12/86 |
| Japan | 39 | 6/86 |
| Canada | 91 | 12/84 |
| France | 78 | 12/86 |
| West-Germany | 64 | 9/86 |
| United States | 42 | 12/87 |

Date source: World Bank. For each of the countries the tops banks are those mentioned in Table 18. Among the 5 French banks are Credit Agricole and Indosuez.

Table 18. Exposure of major to top banks in major creditor nations to Mexico and Brazil.

| | equity as perc. of assets | Mex. exposure as perc. of assets | Mex. exposure as perc. of equity | Bra. + Mex. exposure as perc. of assets | Bra. + Mex. exposure as perc. of equity |
|---|---|---|---|---|---|
| United Kingdom | | | | | |
| Lloyds Bank | 5.3 | 1.9 | 35.5 | 4.5 | 86.2 |
| Barclays Group | 4.7 | 0.8 | 16.1 | 1.3 | 26.8 |
| Midland Bank | 4.0 | 2.1 | 52.5 | 4.4 | 110.5 |
| National Westminster | 5.6 | 0.6 | 10.8 | 1.2 | 20.5 |
| Standard Chartered | 0.6 | 1.1 | 26.2 | - | - |
| average | 4.7 | 1.3 | 28.2 | 2.9 | 61.0 |
| Japan | | | | | |
| Bank of Tokyo | 2.5 | 1.0 | 40.2 | 1.8 | 71.8 |
| Sumitomo Bank | 2.3 | 0.4 | 18.9 | 0.8 | 32.8 |
| Dai-Ichi Kangyo Bank | 2.0 | 0.3 | 17.0 | - | - |
| Sanwa Bank | 2.2 | 0.4 | 8.6 | - | - |
| Mitsubishi | 2.4 | 0.4 | 14.7 | 0.7 | 29.7 |
| average | 2.3 | 0.5 | 21.8 | 1.1 | 44.8 |
| Canada | | | | | |
| Bank of Montreal | 3.6 | 2.2 | 61.3 | 4.6 | 130.0 |
| Royal Bank | 4.2 | 1.7 | 41.6 | 3.4 | 81.8 |
| Scotiabank | 3.9 | 1.4 | 35.6 | 2.5 | 62.3 |
| Canadian Imperial | 4.2 | 1.3 | 31.6 | 2.9 | 68.6 |
| Toronto Dominion | 5.8 | 1.2 | 21.0 | 2.3 | 39.6 |
| France | 4.3 | 1.6 | 38.2 | 3.1 | 76.5 |
| Societe General | 2.9 | 1.3 | 43.2 | - | - |
| Banque National de P. | 2.4 | 0.9 | 41.2 | - | - |
| Credit Lyonnais | 2.4 | 0.9 | 37.1 | - | - |
| average | 2.6 | 1.0 | 40.5 | - | - |

| | | | | | |
|---|---|---|---|---|---|
| West-Germany | | | | | |
| Dresdner Bank | 3.2 | 0.7 | 22.1 | - | - |
| West Landesbank | 2.9 | 0.9 | 32.4 | - | - |
| Commerzbank | 2.8 | 0.5 | 18.6 | - | - |
| Deutsche Bank | 4.0 | 0.2 | 5.3 | - | - |
| Bayer. Landesbank | 2.4 | 0.4 | 14.6 | - | - |
| average | 3.1 | 0.5 | 18.6 | - | - |
| United States | | | | | |
| Citicorp | 4.3 | 1.3 | 29.5 | 3.4 | 78.3 |
| BankAmerica | 3.5 | 2.7 | 76.9 | 5.6 | 159.7 |
| Chase Manhattan | 3.9 | 1.7 | 43.4 | 4.4 | 114.5 |
| Man. Hanover | 3.7 | 2.6 | 71.3 | 5.5 | 149.6 |
| J.P. Morgan | 6.7 | 1.6 | 23.8 | 4.1 | 61.6 |
| average | 4.4 | 2.0 | 49.0 | 4.6 | 112.7 |

Sources: World Bank; 1986 annual reports of French banks, and of West Landesbank and Bayerische Landesbank; July 5, 1988 issue of Commercial Banks, Salomon Brothers; Review of Bank Performance, Salomon Brothers, 1988 Edition.

Table 19. Creditor banks' exposure and market capitalization.

| | Market Capitalization (billions of U.S. dollars) | Exposure to Mexico and Brazil/ Market Capitalization |
|---|---|---|
| **United Kingdom** | | |
| Lloyd Bank | 2.5 | 1.4 |
| Barclays Group | 4.5 | 0.4 |
| Midland Bank | 2.0 | 2.0 |
| National Westminster | 4.4 | 0.4 |
| **Japan** | | |
| Bank of Tokyo | 22.2 | 0.1 |
| Sumitomo Bank | 64.5 | 0.0 |
| Mitsubishi Bank | 53.5 | 0.0 |
| **Canada** | | |
| Bank of Montreal | 2.3 | 1.4 |
| Royal Bank | 3.1 | 0.9 |
| Scotiabank | 1.9 | 0.8 |
| Canadian Imperial | 3.1 | 0.7 |
| Toronto Dominion | 3.9 | 0.3 |
| **United States** | | |
| Citicorp | 7.5 | 0.9 |
| BankAmerica | 1.7 | 3.1 |
| Chase Manhattan | 2.2 | 2.0 |
| Man. Hanover | 1.4 | 2.9 |
| J.P. Morgan | 6.5 | 2.0 |

Sources: World Bank; Company annual reports; July 5, 1988 issue of Commercial Banks, Salomon Brothers; Review of Bank Performance, Salomon Brothers, 1988 Edition.

Table 20. Selected industrial countries: regulation regarding commercial bank provisioning against claims on developing countries at end 1987.

| | Level of Provisioning[1] | Mandatory Provisioning | Tax Deductability of Provisioning | Gear-ability[2] |
|---|---|---|---|---|
| Canada | 30-40 | Yes; 30 percent to 40 percent against a basket of 34 countries | Yes | No |
| France | 30-40 | No[3] | Yes; but for provisioning in excess of average provisions on a case-by-case basis. | Yes |
| Germany | 30-70 | No[4] | Yes; but case-by-case. | No |
| Japan | 5 | Yes; 1 percent to 5 percent for 36 countries | Yes; but limited to 1 percent of rescheduled debt and increased exposure. | Part-ly[5] |
| Switz. | 30-50 | Yes; 30 percent against a group of countries. | Yes; but for provisioning in excess of mandatory provision on a case-by-case basis. | No |
| U. K. | 25-35 | Bank of England guideline: 5 percent to 100 percent depending on country. | Yes; 80 percent of the provisioning value derived from Bank of England matrix. | No |
| U. S. | 25-60[6] | No[7] | No[7] | Yes |

Sources of this table: IMF document.
1/ In percentage of relevant exposure; numbers indicate ranges for major banks.
2/ Indicates whether provisions are included in the capital base used for monitoring capital asset ratio's.
3/ Provisioning suggested against a number of countries with payments difficulties.

4/ Adequacy judged against industry average.
5/ Only the nontax-deductible portion is included.
6/ Some regional U.S. banks have substantially higher provisions.
7/ Except when loans are determined "value-impaired."

1. From internal World Bank document.

2. See Watkins (forthcoming) for a discussion of some of the factors that have influenced bank lending to the developing countries in the 1970s and 1980s.

3. Financial Times, January 21, 1988.

4. Financial Times, October 19, 1987 and February 4, 1988.

5. Wall Street Journal, October 7, 1987.

6. The data in Table 9 is gathered by the Federal Financial Institutions Examination Council and is on a consolidated basis. It differs from the data on developing country exposure of US banks in Table (3), which is on a non-consolidated basis and collected by the U.S. Treasury.

7. As an accounting rule, provisioning for loan loss reserves involves a balance sheet transfer from shareholders' equity to the loan loss reserve. Thus by taking LDC exposure net of the loan loss reserve, the measures of LDC exposure and of bank equity are both net of previous reserving, and double counting is avoided.

8. Sachs and Kyle [1984] use a slightly different specification to analyze the links of stock market prices and LDC debt for data through the third quarter of 1933.

9. Except for the stock price information, the two regressions use the same data which is mostly for year-end 1987. Some data on numbers of stocks outstanding are from Keefe and Bruyette's January 18, 1988 newsletter.

10. All LDC exposure is computed as the sum of exposures to OPEC and non-OPEC Africa, Asia and Latin America.

11. As pointed out by Buynak [1987], the effective tax rate for banks may actually have been raised by the 1986 tax reform act, as banks now face tighter restrictions on foreign tax offsets, a higher alternative minimum tax at 20 per cent, and reduced net-operating loss carry-back from 10 years previously to 3 years now.

12. General operating losses can instead be carried back for 3 years and carried forward for 15 years.

13. The numbers for Exp/MV in the table are quite large as they divide the book value of LDC loans, which have hardly been written down so far, by a stock market measure which already reflects LDC loan discounting.

14. In the U.S bank closure decisions are made by the Comptroller of the Currency.

15. Financial Times, December 7, 1987.

16. From "Indicative prices for less developed coucntry bank loans," Salomon Brothers.

17. Financial Times, February 4, 1988.

18. Data is from national governments.

19. These relative equity figures, however, do not reveal hidden bank resources, such as the unrealized real estate and stock gains that are nowhere to be found on the balance sheets of Japanese banks.

20. New York Times, July 20, 1988.

21. The information in this paragraph is from pp. 24, 80, and 127 of Mullineux [1987].

22. Wall Street Journal, January 26, 1988. The only other occasion where Japanese banks were allowed to deduct loan losses was at the creation of an off-shore factoring company that concentrated some of the Mexican exposure of Japanese banks.

23. The countries are Belgium, Britain, Canada, France, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United States and West Germany.

24. See 'Financial Flows to Developing Countries, Quaterly Review,' September 1988. p. 4.

25. Wall Street Journal, September 30, 1987.

26. New York Times, July 13, 1988.

27. Wall Street Journal, September 30, 1987.

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